

## Claims

1. Equipment for measuring the water vapour flux from a surface which equipment comprises a cylinder with a first end which is adapted to be placed against the surface and at least one sensor which is able to measure the relative humidity or the relative humidity and temperature or quantities from which the flux of water vapour from the surface inside the cylinder can be calculated, which sensor is positioned adjacent the wall of the cylinder.
- 5 2. Equipment as claimed in claim 1 in which the sensor(s) is mounted in the wall inside the cylinder.
- 10 3. Equipment as claimed in claim 1 in which the sensor(s) is mounted on the outside of the cylinder and there is a hole through the wall of the cylinder which hole and sensors are sealed against the atmosphere outside the cylinder.
- 15 4. Equipment as claimed in claim 1 in which there is a hole through the cylinder wall and the sensor(s) is mounted at least partially within such hole and the hole is sealed against the atmosphere outside the cylinder.
- 20 5. Equipment as claimed in any one of claims 1 to 4 in which there are two spaced apart relative humidity sensors and two temperature sensors axially spaced apart positioned adjacent the wall of the cylinder.
- 25 6. Equipment as claimed in claim 5 in which there is a first sensor able to measure the relative humidity and a second sensor which is able to measure the temperature substantially at the location of the first sensor.

7. Equipment as claimed in any one of claims 1 to 6 in which the sensor for measuring relative humidity is based on the change in capacitance or change in electrical conductivity with change in humidity.
- 5 8. Equipment as claimed in any one of claims 1 to 5 in which the cylinder has a first end which is open and a second end which is closed, the first end being adapted to be placed against the surface and there being a cooling means to adapted to cool the second end of the cylinder.
- 10 9. Equipment as claimed in any one of claims 6 to 9 in which the cooling means is based on the Peltier effect.
- 15 10. Equipment as claimed in any one of claims 1 to 5 in which the sensors are a composite sensor which simultaneously measures the relative humidity and the temperature.
11. A method for measuring the water vapour flux from a surface which comprises enclosing a zone adjacent to the surface within a cylinder by placing the open end of the cylinder against the surface and measuring the relative humidity and temperature
- 20 20 or quantities from which the flux of water vapour from the surface can be calculated by means of at least one sensor positioned adjacent the wall of the cylinder.
12. A method as claimed in claim 11 which comprises enclosing a zone adjacent to the surface within a cylinder which is open at one end and closed at the other end by
- 25 placing the open end of the cylinder against the surface cooling the closed end of the cylinder and measuring quantities from which the flux of water vapour from the surface can be calculated.
13. A method as claimed in claim 12 in which the closed end of the cylinder is cooled
- 30 to a temperature at which the water vapour in its vicinity condenses to liquid water or

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ice and steady conditions of water vapour diffusion are established within the cylinder, with the concentration of water vapour in the immediate vicinity of the cold end of the cylinder being lower than in the immediate vicinity of the surface.

- 5 14. A method as claimed in any one of claims 11 to 13 in which the concentration of water vapour is measured by measuring the relative humidity and the temperature ~~at~~ simultaneously at the same location.
- 10 15. A method as claimed in any one of claims 12 to 14 in which the closed surface of the cylinder is cooled by a cooling means based on the Peltier effect and water condensed at the closed end of the cylinder is re-evaporated by heating the surface during times when the instrument is not being used for measurement by reversing the current through the cooling means based on the Peltier effect.
- 15 16. A method as claimed in any one of claims 11 to 15 in which the sensors are mounted in the wall inside the cylinder.
- 20 17. A method as claimed in any one of claims 11 to 15 in which the sensors are mounted on the outside wall of the cylinder and there is a hole through the wall of the cylinder which hole and sensor are sealed against the atmosphere outside the cylinder.
- 25 18. A method as claimed in any one of claims 11 to 15 in which there is a hole through the cylinder wall and the sensors are mounted at least partially within such hole and the hole and sensor are sealed against the atmosphere outside the cylinder.